CONFIDENTIAL

OCE-M77-4/3
18 OCT 1977

MEMORANDUM FOR: Chief, Staff Operations Division, OC-O

25X1A

Chief, Communications Security Staff

INFO   : Chief, Operations, OC

25X1A

FROM   :

Chief, Communications Engineering

SUBJECT   : Message Switch Concentrator/Front End
                (C/FE) Project Team   25X1

25X1   1.   A contract has been awarded to   25X1
25X1   for the software develop-
ment and implementation of a Concentrator/Front End (C/FE)
capability. The attached Statement of Work describes the
contractor and Government responsibilities for this program.

25X1   2.   In order to facilitate program management
and ensure a coordinated effort during the term of this
contract (13 months), a C/FE project team composed of
representatives from the appropriate components is to be
established. These representatives will be responsible
for coordination and implementation of actions affecting
this program with their respective staffs.

25X1   3.   A C/FE project team meeting will be scheduled
later this month and it is requested that you designate
your member to the working group prior to 20 October.

25X1A   the C/FE program manager and, to date,
                                      OC-E/SED/SYB,   25X1A
OC-E/SED/FAB, are assigned as members of this team. The
project team agenda and full membership list will be
forthcoming.

CONFIDENTIAL   25X1

SUBJECT: Message Switch Concentrator/Front End
           (C/FE) Project Team ☐   25X1

25X1

25X1A
     4. ☐ For further information, please contact

☐

25X1A

Attachment:
  As Stated

Distribution:
  Original - Chief, OC-O/SOD w/att.
        1 - Chief, ☐ w/att.
        1 - Chief, OC-CS w/att.
        1 - Chief, OC-O w/o att.

25X1A

Statement of Work

1.0 General

The Contractor will design, develop, test, checkout
and provide to the Sponsor the software necessary to
implement a Concentrator/Front End (C/FE) capability at
a major switching center in the Sponsor's network. The
C/FE will terminate a given subset of communication lines
which will increase the capability of the switching center
and simplify the addition of different line types/protocols
to the network. The C/FE will interface with the Sponsor's
existing message switch located at the center, with remote
terminals and with remote data processing facilities and
equipment. The general scope and conditions of the work
to be performed by the contractor are outlined in a technical
and cost proposal received from [_____]
[_____] Telecommunications Division [_____]
[_____] dated 19 July 1977. The [_____] proposal and the
work proposed therein shall be expanded in terms of
specificity by this Statement of Work (SOW), a System
Functional Specification, and a System Design Specification.
Under the contract ensuing from the [_____] proposal and
this SOW, the place of contract performance shall be at
the Contractor's facility in [_____], as well
as the Sponsor's facility in the Washington, D.C. area.

STAT

2.0 Tasks to be Performed

The Contractor will perform the following:

A. Project Management - The Contractor shall assign
a project manager who will be responsible for directing the
overall program which shall include the design, development,
test, checkout, implementation and documentation of the
C/FE and the planning, scheduling and cost control incident
thereto.

B. Development and Implementation - The integrated
MAX-C/FE will have the following features and capabilities:

(1) [_____] PDP 11/35
     processor - MAX communication via record
     channel (processor-to-processor) lines.
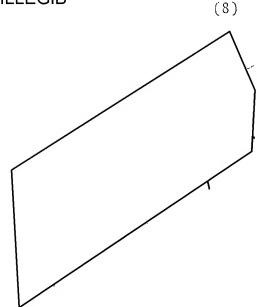
STAT

(2) Operation of the Modem Termination Unit (MTU) lines from the 11/35 bus via B-10 Line Termination Units (LTUs).

(3) Operation of the local Cathode Ray Tubes (CRTs) from the 11/35 bus via B-10 LTUs.

(4) Communication with data processing systems in an interleaved concentrator mode via 4800 Bits Per Second (BPS) lines.

(5) Up to 300 BPS Teletype (TTY) type line servicing from either the MAX Teletype Service Units (TSUs) or the 11/35 LTUs; up to 600 BPS TTY line servicing from the 11/35 LTUs.

(6) Operation of multiple communication lines serviced in a rotary time-division mode using a single LTU with Demand Line Assignment (DLA) and transmission control implemented.

same security class or multiple?

(7) Provision for gradually phasing lines from MAX to 11/35 servicing.

ILLEGIB

(8) Implementation of a full duplex communication protocol in the 11/35 and in a terminal device (Mixer) that will provide and support interleaved, blocked, transmission-controlled communication. Implicit in the 11/35-Mixer protocol will be the checks and balances (regulation) necessary to prevent saturation of a given line/device. Additionally, the 11/35-Mixer protocol shall include provision for total block/data integrity to preclude misrouted and/or missent blocks or crossover blocking. The Mixer software shall operate with and support up to seven local input/output ports plus the 11/35 line input/output. The Mixer software shall include the command/control capability to designate the primary local ports (up to 2) to emulate any one of the remaining ports.

(9) Provision for implementing the ARS CRTs and printers as MAX command/control/log/report positions in lieu of the present MAX peripherals serving the same purposes.

C.   Prepare a System Functional Specification (SFS) for the MAX-C/FE integrated system. The SFS will provide a detailed definition of the 11/35 as a C/FE in conjuction with network operation and MAX III. A performance analysis, including the preliminary analysis presented in the [   ] STAT

STAT   [   ] proposal, will be a part of the SFS and will include:

(1) Traffic characterization, including definitions and assumptions made for analysis purposes.

(2) Message flow models for MAX III, the concentrator, and the Mixer.

(3) Throughput effects on MAX III including buffer utilization and ALU utilization.

(4) Throughput effects on the concentrator, including buffer utilization and ALU utilization.

(5) Throughput effects on the Mixer.

D.   Prepare a System Design Specification.

(1) As part of the overall design specification, a design plan will be made generally consisting of four parts. The first part will contain detailed definition of the modification required to MAX to interface an 11/35 concentrator on a record channel line. The second part will define the changes and additions required to DATEX PCTG software to allow it to function as a concentrator for the MAX system while running in a large core 11/35. The third part will define the Mixer software to be resident in the PDP 11/05 Mixer. The fourth part will define the changes required to ARS software to allow it to work as a standalone switch, using the B-10 LTUs for the medium speed and interleaved/ blocked/protocoled lines.

(2) The design specification will detail the software module interfaces and the software/hardware interfaces. It will also include the plans for software development and testing, system integration, and on-site verification for the application software.

E.   Design, develop, integrate, test, checkout and implement the application software for the integrated MAX-C/FE in accordance with the design specification and as specified in option C of the [   ] proposal and particularly STAT as presented in Section 4.3 through paragraph 4.3.2.4 of the same proposal. Additionally this effort shall include use of the ARS printers and CRTs as specified in 2.B.(9) above.

need document protect integrity features.

F. Provide documentation comparable to and in accordance with the documentation format previously used by the Contractor for the MAX system. The documentation shall include the 11/35 software, the Mixer software and the two MAX Operating System (MCP and NCMH) software modules.

G. Integrate the MAX program changes provided by the Sponsor into the MAX-C/FE system program during the development of the 11/35 software.

H. Provide test and checkout facilities incident to the design, development and integration tests of the MAX-C/FE system at the Contractor's site.

3.0 Sponsor-Furnished Property and Services

The Sponsor will furnish the following property and services for the performance of the contract:

A. An Automatic Relay System (ARS) consisting of DEC PDP 11/35 processors, magnetic tape drives, line printers, CRTs, disc storage units, LTUs, and ARS-associated parts incident to its standalone ARS operation at the final acceptance site.

B. Twenty B-10 LTUs and two record channel interface units for use at the Contractor's facility, if required, and at the final acceptance site.

C. A standalone C-8561 Collins processor with a single C-8874 disc drive at the final acceptance site. The processor and disc drive will be accessable via record channel communication lines for use with the C/FE checkout and acceptance testing.

D. An unclassified source listing and tape of the current MAX III system program.

E. A current set of MAX III program documents, if required.

F. Office space for up to four personnel at the final acceptance site.

G. Unescorted access for contractor personnel at the final acceptance site for personnel meeting site security requirements.

H.   Changes to the MAX software as specified in the [   ] proposal, Appendix C, paragraph 2, option C. These changes will be provided to the Contractor in coding sheet form for integration into the MAX-C/FE system at the Contractor's facility.

I.   As appropriate and required, unclassified test messages for use in the Contractor's development center for the development and checkout of the C/FE.

4.0   Specifications

A.   The controlling specifications in the performance of the contract are this SOW, the [   ] proposal dated 19 July 1977, the System Functional Specification and the System Design Specification.   If changes are necessary to an approved specification, the following change control procedure will govern:

(1) The Sponsor through its Contracting Officer will inform the Contractor of the changes to the specification.

(2) The Contractor will furnish the Sponsor's COTR with a summary of the impact on the project.

(3) The Contracting Officer will formally authorize the contractor to proceed.

B.   The Contractor will adhere to a configuration management plan covering change control procedures, documentation control, maintain requirements, specifications, and design traceability, and establish and maintain required baselines. The Contractor's customary practice will be subject to approval of the COTR and the Contracting Officer.

5.0   Deliverables

The following deliverables will be furnished to the Sponsor in performance of the contract:

A.   A System Functional Specification (SFS).

B.   A System Design Specification.

C.   A project management plan.

D.   System and program documentation as specified in paragraph 2.E. above.

E.   Three copies of the accepted system program in source and object versions, the former in document and magnetic tape form and the latter in machine loadable magnetic tape form.

F.   All Sponsor-furnished property used in conduct of the contract.

G.   A system analysis to be performed after cutover of the integrated MAX-C/FE.   This system analysis shall include:

(1) Hardware measure of the ALU utilization and buffer utilization for MAX, the C/FE, and the Mixer.

(2) Performance curves for MAX, the C/FE, and the Mixer.

. H.   A monthly progress report detailing the events and work performed in the previous month and projecting the work to be performed in the current month.   A full explanation of any project delay and the reason(s) therefor will be included as well as actions taken to prevent recurrence and to regain the delay time.   The report shall be submitted to the Contracting Officer not later than five days after the end of the report month.

6.0   Project Milestones

A.   The following milestones will be met in performance of the contract:

Event	Months ARO
Functional Specification Complete	1.5
Functional Specification Review Complete	2
Design Specification Complete	4
Design Specification Review Complete	4.5
Site Interface Specification Complete	7
Hardware Installation Complete	9

Event	Months ARO
On-site Checkout Complete	11.5
Acceptance Test Complete	12
Documentation Complete	13

B.   The Sponsor will furnish to the Contractor the acceptance test plan at or prior to 9 months ARO.

7.0   Acceptance Test

The MAX-C/FE integrated system will undergo a final acceptance test of 10 days duration. The acceptance test shall be designed, documented, and administered by the Sponsor test team. The test shall consist of continuous on-line operation of the MAX-C/FE integrated system for the period of the test. The equipment specified in Section 3.0 above shall be provided by the Sponsor and used in conducting the acceptance test as will the Mixer equipment. During the acceptance test, operational and test messages will be exchanged with the Sponsor's switching systems, data processing facilities, and remote terminal (Mixer, MTU, and TTY) installations. Successful completion of the acceptance test will be a five day period of demonstrating the capabilities specified in the [   ] proposal, and   STAT
applicable to option C of the proposal, this SOW, the System Functional Specification and System Design Specification.

8.0   Additional Requirements

A.   A monthly review of the Contractor's progress will be conducted at a time and place agreeable to the Contractor and the Sponsor's COTR.

B.   The Sponsor reserves the option of sending up to two observers, in addition to the COTR, to the Contractor's facility to view progress on the effort at times mutually agreeable to the Contractor and Sponsor.

C.   The Sponsor reserves the option to implement or not implement the Switch Software, Appendix C, paragraph 4 of
STAT   the [   ] proposal, in conjunction with the contract. If the Sponsor elects to implement the Switch Software, the implementation will not affect the time schedule of the contract. The design and changes developed for the C/FE which are applicable to the Switch Software will, however, be made available by the Contractor for use by the Sponsor.

D. The Sponsor's COTR shall have review and approval
authority of the System Functional Specification and the
System Design Specification insofar as to ensure that the
specifications of this SOW and the [   ] proposal are   STAT
correctly reflected in the functional and design documents.

E. The personnel assigned by the Contractor for the
performance of the contract will be designated key personnel.
The Contractor will advise the Contracting Officer 30 days
in advance of any change in their assignment.

ROUTING AND RECORD SHEET

SUBJECT: (Optional)

Message Switch Concentrator/Front End (C/FE) Project Team ▢   25X1

FROM:	EXTENSION	NO. OCE-M77- 418
Chief, OC-E		DATE 18 OCT 1977

25X1A

TO: (Officer designation, room number, and building)	DATE RECEIVED	DATE FORWARDED	OFFICER'S INITIALS	COMMENTS (Number each comment to show from whom to whom. Draw a line across column after each comment.)
1. Chief, OC-CS			*Cay*	*RAJ, note TP3 ACTION.*
2. *EAB*				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

FORM 610 USE PREVIOUS EDITIONS   □ SECRET   □ CONFIDENTIAL   □ INTERNAL USE ONLY   □ UNCLASSIFIED
3—62